

REMARKS

Applicants respectfully request reconsideration of the above-captioned application. Applicants have canceled non-elected claims 18-22 without prejudice or disclaimer and have added new claims 25-28 to round out the scope of protection being sought. Favorable reconsideration on the merits is respectfully requested.

The Office Action includes an objection to the title as not being sufficiently descriptive. A new title is proposed which is believed to be even more descriptive than the prior title. In light thereof, reconsideration and withdrawal of this objection is respectfully requested.

The Office Action includes a rejection of claims 1, 2, 4, 5, 7, 8, 10-17, 23 and 24 under 35 U.S.C. §103 as allegedly being unpatentable over IBM Technical Disclosure NN86045000 in view of the Davis et al. patent (U.S. Patent 6,043,861), the Domash patent (U.S. Patent 5,937,115), the Kawano patent (U.S. Patent 6,270,261), and the Hellemeier patent (U.S. Patent 5,889,900); and a rejection of claims 1, 2, 4, 5, 7, 8, 10-17, 23 and 24 under 35 U.S.C. §103 as allegedly being unpatentable over the Stotts patent (U.S. Patent 3,909,113) in view of the Davis et al. patent, the Domash patent, the Kawano patent and the Hellemeier patent. These rejections are respectfully traversed.

The IBM Technical Disclosure

IBM Technical Disclosure NN86045000 discloses a single-mode fiber placed in a quartz block wherein the quartz block and the fiber are ground until the core of the fiber is

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exposed. A cholesteric liquid crystalline helix applied to the polished surface diffracts light out of the fiber at an angle.

As such, Applicants respectfully submit that the optical fiber is not likely characterized as an optical waveguide layer. The IBM Technical Disclosure does not include a filter element "disposed in a position which divides said optical waveguide layer". Instead, it is apparent from the written description that the cholesteric liquid crystal helix is applied to a polished surface of the structure and therefore does not divide a waveguide layer.

Additionally, it is noted that the IBM Technical Disclosure does not reflect light at a predetermined wavelength. Rather, light is diffracted at a predetermined angle. Hence, Applicants respectfully submit that the IBM technical disclosure does not include a majority of the features of the recited optical filter device in claim 1. Claim 12 is even more detailed than claim 1 and it is noted, with respect to independent claim 12, as well as other claims which recite a "groove", the IBM Technical Disclosure does not include this feature either.

The Stotts Patent

The Stotts patent is directed to an optical coupler which includes two optical fibers 10, 21 coupled in a cladding 12 and joined by a cholesteric liquid crystal material. The liquid crystal material 11, 22, "couples out" selected wavelengths and polarizations through the cladding 12 as disclosed in column 5, line 43, through column 6, line 10, for instance.

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Figure 3 is an illustration of another embodiment using a planar or channel type waveguide as the optical path.

The Stotts patent also does not disclose or suggest a filter element which includes a liquid crystal layer having a twisted structure in which a helical pitch reflects light of a predetermined wavelength. Again, it appears to only refract the light so that it couples out of the cladding.

It is noted that in each of the rejections the secondary references are provided for teaching a polymer liquid crystal. Applicants note, with respect, that the claims do not actually recite a polymer liquid crystal. Therefore, it appears that whether or not this teaching exists in the secondary reference it is not relevant to the claimed subject matter. Similarly, the comment regarding "quartz and diode" as being well known high efficiency light sources, is equally not understood.

The Hallemeier Patent

In any event, the Hallemeier patent merely teaches an integrated optical tunable filter which includes polarizers 14 and 16 which are inserted into spaced cuts 32 and 34 which cross a waveguide 12. Hence, even in hypothetical combination, the Hallemeier patent does not teach or suggest a liquid layer having a twisted structure in which the helical path reflects light of a predetermined wavelength acting as a filter element disposed in a position which divides an optical waveguide layer in a waveguide direction.

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The Kawano Patent

The Kawano patent discloses a semiconductor laser module which includes an optical isolator chip 13 which includes a Faraday rotator 1a and polarizing elements 2b on both sides of the Faraday rotator. Hence, the only relevance appears to be the positioning of an optical element within a slot.

The Domash Patent

The Domash patent is directed to a switchable optical component which includes grooves for waveguides of particular configurations. Again, as with the other art, relevance of the Domash patent is not immediately apparent to the undersigned. However, even in combination with the other recitations, it does not include an optical waveguide and a filter element including a liquid crystal layer disposed in a position which divides the optical waveguide layer in the waveguide direction wherein the liquid crystal layer has a twisted structure which the helical pitch reflects a predetermined wavelength. Element 12 is an electronically switchable Bragg grating and to the reading of the undersigned is not in a groove.

The Davis Patent

The Davis patent is directed to an optical waveguide that has two cholesteric liquid crystal polymer layers positioned parallel to each other such that when the polymer layers are in an "on" state, the polymer layers reflect white thereby forming a waveguide. However, this structure does not meet the recitations of an optical waveguide layer wherein

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a filter element including a liquid crystal layer is disposed in a position which divides the optical waveguide layer in a waveguide direction, and the liquid crystal layer has a twisted structure in which the helical pitch reflects light of a predetermined wavelength.

Other pending claims share distinctions mentioned above and include other features which further remove the present invention from the prior art. For sake of brevity, further discussion will not be belabored.

It should be apparent from the foregoing discussion that even taken in combination, the applied art does not teach or suggest the present invention. Accordingly, Applicants respectfully request reconsideration and allowance of the above-captioned application.

Respectfully submitted,

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